

Remarks

Applicants respectfully request favorable reconsideration of the present application in view of the below remarks. Claims 28 to 68 are pending in this application. Claims 28, 45 and 56 are the independent claims, and each has been amended. Favorable reconsideration and further examination are respectfully requested.

Claims 28, 45, and 56 were amended herein to state that the logical configuration of the second volume group is identical to the logical configuration of the first volume group (versus “substantially identical”). The Examiner had argued in the instant Office action that “substantially identical” is to be interpreted as meaning “different”. Applicants respectfully disagree with this contention, and note that Applicants’ previous response (in which arguments were made throughout explaining why “substantially identical” is definite) gave detailed explanation as to why one of skill in the art might possibly consider two logical configurations that differ, say, only by their creation date, as being “substantially” identical. **Applicants further do not agree at all with the Examiner’s interpretation of the claim term “substantially identical” as meaning “different.”** Applicants maintain that the explanation given in their previous Office Action response as to the meaning of “substantially identical” is the one that is correct and applicable to the instant application.

However, in the interest of moving prosecution forward, in being as clear and precise as possible in the claims, and in expediting allowance of the application, Applicants have changed the limitation from “substantially identical” to “identical.” **Applicants believe this change does not change the scope of the claims but instead helps to make the claims simpler and more understandable to those both of skill and not of skill in the art.**

Rejections Under 35 USC 103(a) - Rejections of claim 28, 45, and 56

Claims 28, 45, and 56 stand rejected under 35 USC 103(a) as being unpatentable over U.S. 6574591 to Kleiman et al. (“Kleiman ‘591”) in view of U.S. 6604118 to Kleiman et al. (“Kleiman ‘118”). Claim 28 as amended herein recites [emphasis added]:

A method for managing data that may be replicated from one or more volumes of data that are part of a first volume group on a first computer system having a first operating system, the method comprising the computer-executed steps of:

discovering logical information related to the one or more volumes of data that are part of the first volume group on the first computer system;
creating a map of the logical information to physical devices on the first computer system, the map comprising:

information identifying one or more devices associated with one or more physical volumes containing the data; and

information providing definition and structured layout of volume groups, internal logical volumes and file systems on the first computer system;

*using the map to create a second volume group on a second computer system having a second operating system, where the logical configuration of the second volume group is identical to the logical configuration of the first volume group; and
using the map to reconstruct on the second computer system the internal logical volumes and file systems of the first computer system and mount a duplicate of the one or more volumes of data on the second computer system.*

The applied art is not understood to disclose or to suggest the foregoing features of claim 28, as explained further below. First, the Examiner admits that Kleiman '591 teaches all the limitations of claim 28 except the below italicized portions of claim 28; namely:

(1) using the map to create a second volume group on a second computer system having a second operating system, **where the logical configuration of the second volume group is identical to the logical configuration of the first volume group**; and

(2) using the map to **reconstruct on the second computer system the internal logical volumes and file systems of the first computer system** and mount a **duplicate of the one or more volumes of data** on the second computer system.

To meet these limitations, the Examiner relies on Kleiman '118. Before discussing the merits of Kleiman '118, Applicants again point out the improper combination of Kleiman '118 with Kleiman '591. As Applicants also explained in great detail in the previous response, although claim 28 as amended herein expressly requires that the first and second volume groups have identical logical configurations, Kleiman '591 repeatedly and explicitly states (and, in many instances, requires) that its first and second block arrangements be **different**, as the table below shows:

Kleiman '591	Text (emphasis added)
Col. 1, lines 50-55	It would be advantageous to provide a technique that efficiently copies storage blocks from the source file system (arranged according to a first storage block arrangement) to the destination file system that is arranged according to a <u>second storage block arrangement that differs from the first storage block arrangement.</u>
col. 3, line 65 through col. 4, line 7;	One aspect of the invention transfers data from physical storage blocks that make up a source file system on a first block-oriented media to a second block-oriented media <u>without requiring that the same physical block arrangement be used on the second block-oriented media as the first.</u> Thus, a first storage block arrangement defines the file structure of the source file system and a second storage block arrangement defines the file structure of the destination file system and the <u>first storage block arrangement and the second storage block arrangement are different</u>
col. 4, lines 8-15	[defining swizzling]: <i>a process that re-maps block numbers (BNs) so that file system storage blocks can be stored at different locations on the destination file system than they are on the source file system. Swizzling allows an image transfer from a first file system to a second file system when some of the storage blocks used on the first file system cannot be transferred to corresponding storage blocks on the second file system.</i> [emphasis added]
col. 5, lines 2-5	The arrangement of the storage blocks on the source file system is different from the arrangement of the storage blocks on the destination file system
Col. 5, lines 24-29	One aspect of the invention is that data stored at a particular storage block on the source file system need not be stored at the same storage block on the destination file system. Thus, the arrangement of the storage blocks for the source and destination file systems can be different
Col. 5, lines 35-39	One aspect of the invention is that locations of the storage blocks on the source file system are different from the locations of the storage blocks on the destination file system.
Col. 8, lines 29-32	One advantage of the normalized format is that its use hides the source file system geometry from the destination computer
Col. 14, lines 1-2 (Ind Claim 1)	[A] first storage block arrangement different from said second storage block arrangement
Col. 14, lines 60-62 (Ind Claim 15)	[A] first storage block arrangement different from said second storage block arrangement
Col. 29, lines 64-65 (Ind Claim 29)	Said first storage block arrangement different from said second storage block arrangement
Col. 16, lines 31-32 (Ind Claim 35)	A first storage block arrangement different from said second storage block arrangement
Col. 17, lines 28-29 (Ind Claim 45)	A first storage block arrangement different from said second storage block arrangement
Col. 18, lines 25-26 (Ind Claim 59)	A first storage block arrangement different from said second storage block arrangement
Col. 19, lines 30-31 (Ind claim 73)	A first storage block arrangement different from said second storage block arrangement

Col. 20, lines 3-4 (Ind claim 79)	A first storage block arrangement different from said second storage block arrangement
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As the above table shows Applicants have located at least fifteen (15) passages in Kleiman '591, including every single independent claim (and hence all 88 claims) of Kleiman '591, that recite that the arrangement of storage blocks *differs* from source to destination. Because Kleiman '591 is so very clear in its repeated and total teaching and emphasis on **differing** logical configurations between a source storage block and a destination (copy) of that storage block, Applicants maintain that one of skill in the art would have **no reasonable expectation of success** in using any reference, including but not limited to Kleiman '118, that modified the Kleiman '591 reference in such a way that the first and second logical storage block arrangements are "identical" (i.e., the same). **This completely changes the principle of operation of Kleiman '591 to an exact opposite condition, including the principle of operation of every single one of the 88 claims of Kleiman '591, and, arguably, renders Kleiman '591 inoperable.** MPEP2143.01 clearly states that:

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification . . . If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious

For at least the above reasons, Applicants submit that no person of skill in the art would be motivated to modify Kleiman '591 in such a way as would result in the first and second storage block arrangements of Kleiman '591 as being identical, which is required by claim 28, as amended herein. Because Kleiman '591 is so very clear in its repeated emphasis on differing logical configurations between a source file and a copy of that file, Applicants maintain that one of skill in the art would have **no reasonable expectation of success** in using the teachings of Kleiman '591 and then modifying these teachings, whether with Kleiman '118 or any other reference, in such a way as to **completely change the principle of operation of Kleiman '591.**

In addition, on page 14 of the Office Action, in response to Applicants' arguments made in the previous Office action response, the Examiner further asserts that Kleiman '591 does, in fact teach amended claim 28's limitation of "using the map to create a second volume group on a second computer system having a second operating system, where the logical configuration of the second volume group is identical to the logical configuration of the first volume group? In particular, the Examiner has countered Applicant's assertions by citing Kleiman '591 at col. 1, line 64 to col. 2, line 2. The cited passage states:

Another preferred embodiment reads data from the source file system (in accordance with a first storage block arrangement) creates an image stream and writes the data from the image stream onto the destination file system (in accordance with a second storage block arrangement).

The Examiner contends that the passage teaches reading data from a source in accordance with a first block arrangement and writing the data to a destination file system in accordance with a second storage block arrangement. Even if this is accurate, it still does not meet the limitations of claim 28, as amended herein, because the above passage of Kleiman '591 never teaches or suggests that the second block arrangement is identical to the first block arrangement, as required by claim 28. Merely saying that data is written from one block to another does not suggest, inherently or implicitly, that the two blocks have the same logical configuration.

In an attempt to compensate for the deficiencies of the Kleiman '591 reference, the Examiner further relies on Kleiman '118 in combination with Kleiman '591. The Examiner has cited various passages in Kleiman '118, which Applicant commented upon in the previous office action response. None of the cited passages, or any other passage in Kleiman '118, teaches or suggests the limitations missing from Kleiman '591, namely:

(1) using the map to create a second volume group on a second computer system having a second operating system, **where the logical configuration of the second volume group is identical to the logical configuration of the first volume group**; and

(2) using the map to **reconstruct on the second computer system the internal logical volumes and file systems of the first computer system** and mount a **duplicate of the one or more volumes of data** on the second computer system.

The Examiner cites additional passages in Kleiman '118 as allegedly providing motivation to combine Kleiman '118 with Kleiman'591. Applicants reiterate that one of skill in the art could not possibly have any motivation to modify Kleiman '591 in any way that would result in first and second storage blocks having the same arrangement. Assuming, *arguendo*, that there possibly would be motivation to combine Kleiman '591 with Kleiman '118, the instant invention of claim 28, as amended herein, still would not be achieved.

In particular, the Examiner cites Kleiman at col. 1, lines 59-61, a passage that refers to duplicating all or part of a file system via consistent "snapshots" (copies) of a file system that are maintained so that the consistent snapshots can be transferred at a storage block level using the file servers own block operations. Col. 4, lines 18-46 of Kleiman '118 describe a so-called "snapshot", where the snapshot is:

a set of storage blocks, the member storage blocks forming a consistent file system, disposed using a data structure that allows for efficient set management . . . the data structure for the snapshot is stored in the file system so there is no need to traverse the file system tree to recover it. In a preferred embodiment, each snapshot is stored as a file system object, such as a blockmap. The blockmap includes a bit plane having one bit for each storage block, other than bits used to identify if the storage block is in the active file system

The snapshot of '118 in the cited passage does not seem to be used in the same way as the map of amended claim 28 (i.e., to reconstruct on the second computer system both the internal logical volumes and file systems of the first computer system). Rather, Kleiman '118 relates to copying file system information, not volume level information. In particular, Kleiman '118 says specifically that the snapshot is different than an active file system because the snapshot is a read-only copy of the file system, whereas the file system is a consistent file system that is used, modified, and updated frequently; the snapshot are used "for backup and mirroring of the file system" (Kleiman '118 at col. 6, lines 8-26). Thus, the snapshot is a copy of the file system only, not the logical volume information, definition and structured layout of volume groups,

internal logical volumes, etc., that are part of the “map of the logical information to physical devices” of the invention of claim 28.

Applicants additionally note that even if the information of Kleiman ‘118 is transferred at the storage block level, the actual information being transferred is not information that can “reconstruct on the second computer system the internal logical volumes and file systems of the first computer system and mount a duplicate of the one or more volumes of data on the second computer system,” as required by claim 28. It is only file system information, which is simply not the same.

Accordingly, for at least the reasons described above, Applicants argue that the combination of Kleiman ‘118 and Kleiman ‘591 still fails to teach or suggest all of the limitations of claim 28, because Kleiman ‘118 and Kleiman ‘591, taken individually or in combination, still fail to teach the limitations (1) and (2) of claim 28 as amended herein. Thus, Applicants maintain that claim 28, together with all claims dependent therefrom (namely, claims 29-44 and 59-64) are patentably distinguishable over Kleiman ‘591 and Kleiman ‘118, taken alone or in combination. Accordingly, Applicants respectfully request that the rejection of claims 28-44 and 59-64 be withdrawn.

Independent claims 45 and 56, as amended herein, contain limitations similar to those of claim 1. For at least the reasons argued above in connection with amended claim 28, Applicants likewise maintain that amended claims 45 and 56, together with all claims dependent therefrom (namely, claims 44-54;65-68 and 57-58, respectively) are patentably distinguishable over Kleiman ‘591 and Kleiman ‘118, taken individually or in combination. Accordingly, Applicants respectfully request that the rejection of claims 45-58 and 65-58 be withdrawn.

Rejection of claims 29-44, 46-66 57-68

Claims 29-44, 46-55, and 57-68 stand rejected under 35 US C 103(a) over Kleiman ‘591 in view of Kleiman ‘118 and further in view of Markson et al. (US 20020103889A1) (“Markson”). Each of claims 29-44, 46-55, and 57-68 depends from one of the independent claims 28, 45, and 56, as amended herein. As argued above in connection with these

independent claims, Kleiman '591 and Kleiman '118, taken individually or in combination, still fail to teach each and every limitation of each of these independent claims.

Markson is directed to a method for selectively and logically adding storage to host features dynamically by mapping one or more disk volumes to the host using a storage virtualization layer (emphasis added, see Abstract of Markson). As shown in FIG. 2C, Markson focuses on increasing storage capacity. Markson does not disclose or suggest using the mapping to duplicate volumes of data; but rather, Markson is mapping new storage with empty volume locations for new data. None of these cited paragraphs disclose or suggest duplicating much less using the map to reconstruct on the second computer system the internal logical volumes and file systems of the first computer system and mount a duplicate of the one or more volumes of data on the second computer system (emphasis added). Thus, Markson does not compensate for the insufficiencies of the Kleiman '591 and Kleiman '118 references.

Accordingly, for the above reasons and for those discussed previously in connection with independent claims 28, 45, and 56, as amended herein, even if Markson were combined with Kleiman '591 and Kleiman '118, the resulting hypothetical combination still does not disclose or suggest each and every limitation of independent claim 28, 45, and 56 (i.e., using the map to reconstruct on the second computer system the internal logical volumes and file systems of the first computer system and mount a duplicate of the one or more volumes of data on the second computer system). Because the hypothetical combination of Kleiman '591, Kleiman '118 and Markson does not teach each and every limitation of the independent claims 28, 45, and 56, as amended herein, it cannot possibly teach each and every limitation of dependent claims 29-44, 46-55 and 57-68. Thus, Applicants maintain that claims 29-44, 46-55 and 57-68 are patentably distinguishable over Kleiman '591, Kleiman '118 and Markson, taken individually or in combination. Accordingly, Applicants respectfully request that the rejection of claims 29-44, 46-55 and 57-68 under 35 USC 103(a), over Kleiman '591, Kleiman '118 and Markson, be withdrawn.

According to the Federal Register, Volume 72, No. 195, dated October 10, 2007, at page 57528, Part III of the section entitled "Examination Guidelines for Determining Obviousness

under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*,” in order to establish a prima facie case of obviousness “...the prior art reference (or prior art references when combined) need not teach or suggest all the claim limitations.” However, as also stated in Part III, in order to establish prima facie obviousness, “[t]he gap between the prior art and the claimed invention may not be ‘so great as to render the [claim] nonobvious to one reasonably skilled in the art.’” Applicants respectfully submits that, based on the above arguments, the Examiner has not met this burden in order to establish prima facie obviousness, at least for the reasons given in connection with the rejection of independent claims 28, 45, and 56, as amended herein, in particular because the Kleiman ‘591 so clearly and repeatedly teaches the opposite of what is required by claims 28, 45, and 56 as amended herein.

In addition, according to the Federal Register, Volume 72, No. 195, dated October 10, 2007, at page 57528, Part III of the section entitled “Examination Guidelines for Determining Obviousness under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*,” an obviousness rejection may be made using the familiar teaching-suggestion-motivation (TSM) rationale... .” In Part III, it is also stated that “[a]lthough the Supreme Court in *KSR* cautioned against an overly rigid application of TSM, it also recognized that TSM is one of a number of valid rationales that could be used to determine obviousness.” Thus, as one criteria used to establish prima facie obviousness, there should be some suggestion and motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Applicant respectfully submits that the Examiner has not shown a sufficient suggestion or motivation to modify the references or to combine reference teachings, in particular because the Kleiman ‘591 reference so clearly teaches away from the limitations of claims 28, 45, and 56 as amended herein.

Applicants submit that all dependent claims now depend on allowable independent claims.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or

concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for withdrawing the prior art cited with regards to any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Applicants submit that the entire application is now in condition for allowance. Such action is respectfully requested at the Examiner's earliest convenience.

All correspondence should be directed to the address below. Applicants' attorney can be reached by telephone at (781) 401-9988 ext. 122.

No fee is believed to be due for this Response; however, if any fees are due, please apply such fees to Deposit Account No. 50-0845 referencing Attorney Docket: EMC-038PUS.

Respectfully submitted,

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